speed of a little more than twenty-two miles per hour, the centre arriving at St. Thomas about 4 P.M. on the 21st. What was the speed and force of its rotary motion, I have no means of correctly ascertaining; but there is no doubt that near the centre it very greatly exceeded that of its progressive motion. The diameter of the storm was about eighty miles, the outer circles taking in at the same time Montserrat in the south, and Barbuda in the north; but was not felt beyond those islands. In its progress towards the west and north it may have extended itself, as is frequently the case with these storms.

On the afternoon of September 25, we again had indications of an approaching cyclone, though not so marked and distinct as on the former occasion. The gale set in about 10 P.M., from N. by E., and continued till 10 A.M. on the 26th, the wind changing to N.N.W. and S.W. The centre just touched the north of the island at 4 A.M. on the 26th. The force of the wind was at no time very great, and did not prove destructive on land—though causing much anxiety and alarm during its progress. The barometer did not fall on this occasion more than half-an-inch.

G. W. WESTERBY

Antigua

## *PROFESSOR S. F. B. MORSE*

INTELLIGENCE has already been received in this country of the death of Samuel Finley Breese Morse, the eminent electrician, who died at New York on the 2nd inst. at the age of eighty-one. Prof. Morse was the son of the Rev. Jedediah Morse, well known as a geographer, and was born at Charlestown, Massachusetts, on the 27th of April, 1791. He was educated at Yale College, but, having determined to become a painter, he came to England in 1811, formed a friendship with Leslie, and in 1813 exhibited at the Royal Academy a colossal picture of "The Dying Hercules." He returned to America, and for a few years followed the profession of a portrait painter. In 1829 he again visited England, and on his return voyage was accompanied by Prof. Jackson, the eminent American chemist and geologist, through whose influence he turned his attention to the conduction of electricity through metallic wire, a subject in which the chemical tastes displayed by him while at College gave him additional interest, and to which he now devoted the whole powers of his mind.

Between 1835 and 1837 Prof. Morse invented several machines which more or less foreshadowed the electric telegraph; and obtained from Congress a vote of 30,000 dollars, with which to make an experimental essay between Washington and Baltimore. The first electric telegraph completed in the United States was the line between these cities, which was finished in 1844. Since that time the Recording Electric Telegraph of Morse has been adopted over the whole country, and at the time of his death there were not less than twenty thousand miles of electric wires, stretching over the States between the Atlantic and the Pacific Ocean.

Prof. Morse received during his life recognition of his services to science from a large number of foreign Governments and scientific societies, not the least remarkable being the one inspired by the late Emperor of the French. At his suggestion delegates from France, Russia, Sweden, Belgium, Holland, Austria, Sardinia, Tuscany, the Holy See, and Turkey, met at Paris, and voted an award of 400,000 frs. to Prof. Morse as a testimonial of appreciation of his services.

A record of Prof. Morse's scientific career would not, however, be complete, without referring to a controversy which some years ago occupied the attention of the scientific world in the United States, in which he was engaged with Prof. Henry, now President of the Smithsonian Institution at Washington. So much personal matter was introduced into the dispute that a special committee of the Board of Regents of the Smithsonian Institution was appointed to investigate the matter, the report of which now lies before us. The result of this investigation is summed up as follows:—

"We have shown that Mr. Morse himself has acknowledged the value of the discoveries of Prof. Henry to his electric telegraph; that his associate and scientific assistant, Dr. Gale, has distinctly affirmed that these discoveries were applied to his telegraph, and that previous to such application it was impossible for Mr. Morse to operate his instrument at a distance; that Prof. Henry's experiments were witnessed by Prof. Hall and others in 1832, and that these experiments showed the possibility of transmitting to a distance a force capable of producing mechanical effects adequate to making telegraphic signals; that Mr. Henry's deposition of 1849 . . . . is strictly correct in all the historical details, and that, so far as it relates to Mr. Henry's own claim as a discoverer, is within what he might have claimed with entire justice; that he gave the deposition reluctantly, and in no spirit of hostility to Mr. Morse; that on that and other occasions he fully admitted the merit of Mr. Morse as an inventor; and that Mr. Morse's patent was extended through the influence of the favourable opinion expressed by Prof. Henry."

The conclusion therefore which must be arrived at, and it is one of no small importance in the history of electrical and telegraphic science, is that to Prof. Henry, and not to Prof. Morse, is unquestionably due the honour of the discovery of a principle which proves the practicability of exciting magnetism through a long coil, or at a distance, either to deflect a needle or to magnetise soft iron.

Prof. Morse's services to science as a successful applier of this principle in its practical details are so unquestionable, that we feel we are but doing a duty in setting this question right on this side the Atlantic.

## *NOTES*

THE following are the names of the candidates who have been selected by the Council of the Royal Society for admission into that body at the forthcoming annual election:—Surgeon-Major Andrew Leith Adams, Prof. W. G. Adams, F. Le Gros Clarke, M.R.C.S., Prof. John Cleland, M.D., Dr. M. Foster, Dr. Wilson Fox, Dr. Arthur Gamgee, Rev. Thomas Hincks, Prof. W. Stanley Jevons, Prof. T. Rupert Jones, Dr. George Johnson, Major T. G. Montgomerie, R.E., Dr. E. L. Ormerod, E. J. Routh, and Dr. W. J. Russell.

AT the meeting of the Royal Geographical Society, held on Monday evening last, a letter was read addressed to the President by Dr. Kirk, H.B.M. consul at Zanzibar, in which that gentleman expressed himself very hopefully of Dr. Livingstone's safety. He thinks there is nothing discouraging in the last news received of him, and that we cannot expect to hear again until the war at Unyanyembe is closed.

H.R.H. THE DUKE OF EDINBURGH will hold a reception on Saturday evening next in the Picture Galleries of the International Exhibition and in the Royal Albert Hall, on behalf of the Prince of Wales and the Royal Commissioners.

WE understand that Lieut-Colonel Strange, F.R.S., will exhibit at the ordinary meeting of the Royal Society on Thursday, May 2nd, the Great Theodolite designed by him for the Great Indian Trigonometrical Survey of India, and will read a paper descriptive of it.

THE electors of the Waynflete Professorship in Chemistry at Oxford have given notice that it is their intention to proceed to the election of a Professor some time in Act term next. The endowment assigned to the Professorship is 600*l.* per annum, payable out of the revenues of Magdalen College. The residence required by the College ordinance is six calendar months, at least, between the 10th day of October in every year and the first day of the next ensuing July. By the same ordinance the College may require certain services from the Professor; but the functions and duties of the office are mainly regulated by a statute of the University, the provisions of which, as well as of the College ordinance, may be obtained from the President of Magdalen, to whom persons intending to become candidates are requested to send in their names, and any papers which they may wish to present to the electors in support of their application, on or before the 18th of May.

The next triennial prize of 300*l.* under the will of the late Sir Astley T. Cooper, Bart. will be awarded to the author of the best essay or treatise on "Injuries and Diseases of the Spinal Cord." The essays or treatises shall contain original experiments and observations, which shall not have been previously published, and each essay or treatise shall be illustrated by preparations, and by drawings, which shall be added to the Museum of Guy's Hospital, and shall, together with the work itself, become henceforth the property of the Institution. Essays must be sent in to Guy's Hospital on or before January 1, 1874. If written in a foreign language they must be accompanied by an English translation.

Radcliffe Studentships for persons studying medicine, and desirous of making use of the museum and lectures at Oxford, have been awarded to Mr. Francis T. Carey, of Guy's Hospital, and Mr. C. R. B. Keetley, of St. Bartholomew's Hospital, on the recommendation of Sir James Paget, Sir William Gull, and Dr. John Ogle; and to Mr. Farington M. Granger, of the Hospital of Leeds, on the recommendation of T. P. Teal, M.A., M.B.

M. Stewart of Rossall School has been elected to the Exhibition of 50*l.*, at St. John's College, Cambridge, tenable for three years, for Natural Science. The examiners also honourably mentioned Anderson, of Rugby School, and King's College, London. There were seven candidates. The examiners were —Chemistry, Mr. Main; Physics, Mr. A. Freeman; Physiology, Dr. Bradbury; Geology, Mr. Bonney; Botany, Mr. Hiern.

Captain G. S. Nares will, on his arrival in England from the Mediterranean, commission the unarmoured screw corvette *Challenger* for special exploring and surveying duties in the Pacific. The *Challenger* is a vessel of 2,306 (1472) tons and 1509 (400) horse power.

It is proposed, according to the *American Naturalist*, to add a department of Science to the executive branch of the United States Government. It is to be composed of the Storm Signal Corps of the army, the Lighthouse Board, and the Coast Survey Bureau of the Treasury, and the Hydrographic Bureau of the Navy.

We hear that a proposition is on foot to establish an Agricultural-Meteorological station at Montrouge, near Paris, under the superintendence of M. Ch. Moureaux.

A communincation to the Corporation of Brown University, in America, was recently presented from Colonel Stephen T. Olney, making a munificent offer of his herbarium and books on botany, on condition that a suitable building should be provided for their reception. It was referred to a committee.

The officers of the Boston (U.S.) Young Men's Christian Union, recognising the importance of scientific studies and the need of encouraging scientific tastes, have determined to establish in the rooms of the Union a natural history cabinet. Their object in providing such a collection is to foster the growing taste for science among the young men of Boston, and to open a new source of instruction and amusement to the members of the Union.

A very interesting collection of water-colour drawings made by Mr. W. Simpson, on the various excavations below the modern city of Jerusalem, which have been carried on for the past three years by the Palestine exploration, under the superintendence of Captain Warren, of the Engineers, is now placed for exhibition in the Gallery, 48, Pall Mall. Most of the drawings are taken in the excavations or in the sacred tombs and caves; but the artist has made his series complete by two or three which represent the massive walls of Jerusalem as they are now to be seen above ground, as well as that part of them which has been discovered at the depth of 125 ft.

At the meeting of the Manchester Literary and Philosophical Society on March 19, the President, Mr. E. W. Binney, read an elaborate paper, entitled "Additional Notes on the Lancashire Drift Deposits."

At the Annual Meeting of the Bengal Social Science Association, Dr. Ewart, the president, delivered an excellent address on the necessity for the introduction into the schools preparing students for the entrance examination of the University of Calcutta, of the study of the rudimentary principles of the natural and physical sciences. Although the University was avowedly founded on the model of the London University, the traditional policy of the older Universities is apparent in the exclusion of Science; and a movement commenced last year to introduce examination in various branches of science has at present failed. Dr. Ewart points out with great force the injury which the higher education has suffered in England from a similar course, and that the "existing metaphysical system of education is fast flooding the country with a class of gentlemen who cannot find occupation suitable to the kind and nature of the training they have received." "Are we to wait here," he inquires, "simply to follow in the wake of England in this matter? Is India to go through a long embryo state of preparation like the Western nations, extending over many centuries?"

A new technical paper has been started at Brussels, entitled *Chronique de l'Industrie*, answering to our English papers, the *Engineer* and *Engineering*.

Dr .L. Pfeiffer, of Cassel, has published the two first parts of a work which will be indispensable to every systematic botanist, "Nomenclator Botanicus," being an alphabetical enumeration of the names of all classes, orders, tribes, families, divisions, genera, sub-genera, and sections of plants, published down to the end of the year 1858, with copious references to the authorities, systematic arrangement, synonymy, and first publication. From the care evidenced in the parts already published, the work will supply a desideratum long felt in botanical literature; and the author, who is an amateur man of science holding no official position, deserves the thanks of all botanists. Arrangements are made by which the work may be carried down to the present time.

Mr. C. P. Hobkirk, of Huddersfield, announces as in course of preparation, A Synopsis of the British Mosses, in 1 vol. 8vo.

The long-expected translation of Le Maôut and Decaisne's "Traité Géneral de Botanique," by Mrs. J. D. Hooker, is announced by Messrs. Longman as in the press.

Messrs. Bradbury and Evans have in the press "Botany for Beginners," by Dr. Maxwell T. Masters, F.R.S., a portion of which has already appeared in the columns of the *Gardener's Chronicle*.

A very interesting series of articles on the animals contained in the Crystal Palace Aquarium, by Mr. Edward Newman, F.L.S., is now being published in *The Field*.

The Catalogue of Microscopical Preparations in the Quekett Microscopical Club, consisting of about 2,000 slides, is chiefly of interest from the plan on which they are classified. The arranging and cataloguing a large collection of microscopical preparations in a satisfactory manner is admitted to be a work of considerable difficulty. In the present instance the catalogue is divided into five groups, containing Vertebrata, Invertebrata, Phanerogamia, Cryptogamia, and Mineral Substances. Each of the groups Vertebrata and Invertebrata is again subdivided into orders; and the Phanerogamia into stems, fibres, cell structure, cuticles, hairs, pollen, seeds, and starches. The Cryptogamia are subdivided into ferns, mosses, fungi, characeæ, algæ, desmids, and diatoms. The minerals are without subdivision. Although this classification is open to some objections, yet, on the whole, it was perhaps about the best which could have been done with the materials; and the catalogue, which is on sale for the benefit of microscopists generally, will furnish a long list of objects for those who are collecting. In some of the subsections —as, for instance, the hairs of bats, fructification of ferns, and microscopic seeds—the cabinet appears to be remarkably complete. Indeed, it is doubtful whether these sections can be equalled in the cabinet of any other society.

IN a letter to the Minister of Foreign Affairs, brought before the French Academy on February 26, a report is given of the earthquake shock felt at Malaga on January 28 at $3^h\ 1^m$ P.M. The undulatory movement lasted from four to six seconds, and subterranean noises were heard previously to the shock. The direction was from north to south. No damage is reported.

THE *American Journal of Science* gives an account of the earthquake of the 9th of January experienced in New England. It occurred over a considerable portion of Eastern New England and the St. Lawrence Valley, at a few moments before 8 P.M. on January 9. It was felt along the St. Lawrence River to a distance of 200 miles north-east and 60 miles south-west from Quebec, and at various points of New Hampshire and Maine. The disturbance was greatest at Quebec, where some walls were cracked, and large fissures caused in the ice bridge over the river. The shock occurred there at 7·54 P.M. and lasted about thirty seconds, being accompanied by a low rumbling sound. At Lancaster, in New Hampshire, there were two distinct shocks, each lasting but a few seconds, the last being the most violent. The direction of vibrations was well defined, and approximately west to east. Probably the true direction was from a point somewhat south of west, which would coincide nearly with the course of the St. Lawrence River, and with the shorter diameter of the region shaken. At Quebec and Bangor slight shocks were felt at 3 P.M. and 11 P.M. on the same day.

THE towns of Dresden, Perna, Schandau, Chemnitz, Bodenbach, Wurmar, and Rudolstadt, were visited almost simultaneously by a succession of earthquake shocks between three and four o'clock on Wednesday, March 6. They continued to recur during an hour, and in some instances during several hours. Little damage was done.

A CORRESPONDENT of the *Times*, telegraphing from Alexandretta, states that half the town of Antioch was destroyed by an earthquake on April 3. Fifteen hundred persons were killed. Great distress prevails in consequence. The shock was also felt at Aleppo, but without any damage being done.

WE have received the second part of the Proceedings of the Bristol Naturalists' Society for 1871. Like other similar publications which we have had occasion to notice recently, it contains no original articles bearing on the natural history of the district, or containing original observations. The proceedings of the Sections are also rather scant, though they bear evidence of some work having been done in Geology and Entomology.

WE have received a series of chemical labels published by Messrs. Mottershead and Co., of Manchester. The labels are printed in good legible type, better than is usual in such cases, the backs being gummed ready for use. No definite system of chemical nomenclature has been used, in many instances the common or old names of the reagents are given, although perhaps in some cases to the sacrifice of scientific accuracy. Contrary to the usual practice, no symbols are attached, the publishers preferring to leave space for the insertion of these, according to the views held by each chemist. At the end of the reagents a number of slips are attached, with the words "pure," "commercial," &c., to qualify the foregoing labels. The total number given is considerable, forming a very good and cheap series (9*d.*)

## OBSERVATIONS OF THE AURORA BOREALIS OF FEBRUARY 4 & 5, 1872 *

THE splendid aurora by which our sky was illuminated yesterday evening was remarkable for the great variety of appearances which it displayed, for its intensity, its duration, and lastly for the large expanse of sky over which it spread. In fact it exhibited collectively all the principal phenomena observed in former appearances of this meteor: that is to say, luminous arches of various colours, dark arches, moveable clouds of red and green colour, bright rays both isolated and united in large bundles, dark rays, diverging and converging rays, red pillars, changes of colour, &c., &c. It lasted from about six o'clock till after midnight, whereas in most cases the duration of the phenomenon does not exceed a few hours, and is not unfrequently less than an hour. The auroral light, under various forms and colours, extended over nearly the whole of the sky, whereas it is usually limited to the northern region.

The want of magnetic instruments prevented me from foreseeing by their perturbations the approach of the phenomenon, so that I did not perceive it till about 6h. 30m., by which time it was already developed in vast proportions. I arrived, however, in time to observe all the principal phases, and to analyse the various coloured lights with the spectroscope.

Although the numerous phenomena observed in this aurora did not present anything actually new, still their detailed description will be of great advantage to science, as exhibiting the order of their succession and their mutual relations and dependences. Such scope, however, could be attained only by a long and systematic description; and for the present I must limit myself to an account of my spectroscopic observations.

The greenish yellow light which illuminated certain arches and isolated clouds, and likewise the part of the sky near the magnetic meridian, appeared, when examined by the spectroscope, to be monochromatic, its spectrum being almost wholly concentrated in a beautiful green line, the position of which was very near the division 1241 of Kirchhoff's scale.

In the brightest parts nearest to the magnetic meridian, and in a few yellow rays near the zenith, I discovered, by means of the spectroscope, a second green line situated towards the blue, and corresponding very nearly with the division 1820 of Kirchhoff's scale. The line 1241 is near a known line of iron, and 1820 is near a known line of atmospheric air.

The second green line was very much less bright than the first, but nevertheless very distinct. Between these two lines were traces of several other faint lines, the position of which I was unable to determine.

On the decidedly red mass I could not make out any distinct bright line, but only certain bands of continuous spectrum. On the yellow-red mass I detected the bright line 1241, without any distinct lines in the red.

The spectroscopic observations were continued with the same results till about the middle of the night, when the aurora had almost entirely vanished.

The atmospheric conditions during the phenomenon were normal, only a few masses of cloud being seen from time to time near the horizon; and I observed an appearance which seemed to me especially worthy of notice—namely, a continuous glow proceeding from the horizon towards the S.S.E., by which some clouds and a stratum of mist were lighted up almost continuously

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* Translated from the *Gazetta Ufficiale del Regno d'Italia*, Feb. 6.